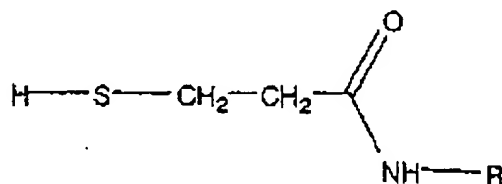
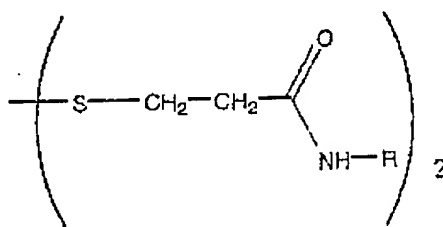


wherein the compound represented by formula (I),



or alternatively, the compound represented by formula (II),



is reacted with chlorine (Cl_2) as a chlorinating agent in a solvent in which hydrogen chloride is insoluble or has low solubility,

wherein the molar-equivalent ratio of said chlorinating agent to the compound of formula (I) is 2:1, or alternatively,

wherein the molar-equivalent ratio of said chlorinating agent to said the compound of formula (II) is 3:1,

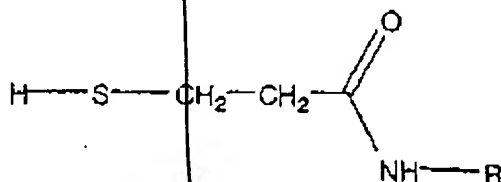
wherein R in the compounds of formulas (I), (II), and (III) represents C1 to C8 alkyl groups or aralkyl groups, and

wherein the 2-alkyl-4-isothiazoline-3-one of Formula III produced is essentially free of 5-chloro-2-alkyl-4-isothiazoline-3-one.

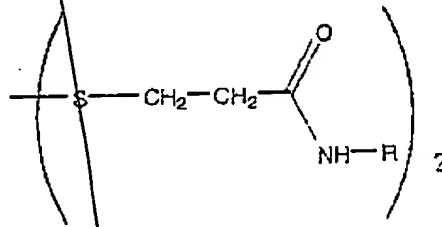
Please add the following new claims:

20. A method of producing 2-alkyl-4-isothiazoline-3-one represented by the general formula (III),

wherein the compound represented by formula (I),



or alternatively, the compound represented by formula (II),



is reacted with chlorine (Cl₂) as a chlorinating agent in a solvent in which hydrogen chloride is insoluble or has low solubility,

wherein the molar-equivalent ratio of said chlorinating agent to the compound of formula (I) is 2:1, or alternatively,

wherein the molar-equivalent ratio of said chlorinating agent to said the compound of formula (II) is 3:1,

wherein R in the compounds of formulas (I), (II), and (III) represents C1 to C8 alkyl groups or aralkyl groups, and

wherein the 2-alkyl-4-isothiazoline-3-one of Formula III produced contains less than 1.0% of 5-chloro-2-alkyl-4-isothiazoline-3-one.

21. The method of producing 2-alkyl-4-isothiazoline-3-one stated in Claim 20 in which the 2-alkyl-4-isothiazoline-3-one of Formula III produced contains less than 0.5% of 5-chloro-2-alkyl-4-isothiazoline-3-one.

22. The method of producing 2-alkyl-4-isothiazoline-3-one stated in Claim 20 in which the chlorine (Cl₂) chlorinating agent is a gas.

23. The method of producing 2-alkyl-4-isothiazoline-3-one stated in Claim 1 in which the chlorine (Cl₂) chlorinating agent is a gas.